REMARKS

Claim 15-19 and 22-31 are pending. Claims 15, 19, and 24-27 are amended. Claims 20 and 21 are Cancelled. Claim 31 has been added. Applicant requests reconsideration and reexamination of the pending claims.

Claims 15-30 are rejected over a combination of the *Ollivier* (U.S. Patent No. 6,363,958) in view of *Tsourides et al.* (U.S. Patent App. No. 2002/0038673) and *Porter et al.* (U.S. Patent App. No. 2002/0124961). Applicant overcomes the rejection as follows.

The arrangement of components of the mass flow controller of the present invention provide a "canceling" of perturbations to the flow rate caused from fluctuations in pressure at either the inlet or outlet sides of the mass flow controller.

Claim 15 sets forth, *inter alia*, "said pressure sensor unit operatively mounted in the fluid passageway in such close proximity to said flow rate sensor unit that measurement and adjustment of the pressure in said fluid passageway is kept substantially constant at the flow rate sensor unit." In addition Claim 15 sets forth, "the control unit configured to provide a first control signal to said pressure control valve unit in response to said pressure signal to avoid an affect on the flow rate in the fluid passageway due to a pressure fluctuation at the inlet of the mass flow controller, and the control unit configured to provide a second control signal to said flow rate control valve in response to said flow rate signal to avoid an affect on the flow rate in the fluid passageway due to a pressure fluctuation at the outlet of the mass flow controller."

Claim 19 sets forth, *inter alia*, "a controller for controlling the pressure control valve in response to an output of the pressure sensor to avoid an affect on the flow rate due to a pressure fluctuation at the inlet of the mass flow controller and for controlling the flow rate control valve in response to an output of the flow rate sensor to avoid an affect on the flow rate due to a pressure fluctuation at the outlet of the mass flow controller."

As set forth in the claims, the pressure control valve 4 and flow rate sensor 5 are arranged side by side, and the second passage 2b disposed between them is designed as short as possible, so that the time delay of pressure Pc with respect to the output of the control signal Cp of the pressure control valve 4 is minimized, and thus fluctuations of pressure Pc in the section of the flow rate sensor 5 are made as small as possible.

Further, in the second passage 2b between the pressure control valve 4 and flow rate sensor 5, the pressure sensor 7b is disposed at a position as close to the flow rate sensor 5 as possible, so that measurement of the pressure and adjustments thereto can be controlled with signal Cp with minimal delay, to provide a substantially constant pressure in the immediate vicinity of the flow rate sensor. As a result, the control accuracy and stability of flow rate by the mass flow controller 1 can be enhanced.

As set forth in the claims, the control unit controls the pressure control valve 4 using feedback of the specified pressure Pc adjacent the flow rate sensor by using the pressure signal Spb from the pressure sensor 7b. Therefore, if the inlet side pressure P_1 of the mass flow controller 1 fluctuates due to some affects, the pressure Pc at the flow rate sensor can be kept substantially constant so as to allow the flow rate sensor to measure accurately.

The control unit also controls the flow rate control valve 6 using feedback so that the measured flow rate F may conform to the preset flow rate Fs by using the flow rate signal Sf from the flow rate sensor 5. Therefore, if the outlet side pressure P_2 of the mass flow controller 1 fluctuates, the flow rate is free from its affects.

These claimed features are not found on the *Ollivier* reference.

Instead, the *Ollivier* reference discloses a method of controlling the batchwise delivery of process gas for semiconductor manufacturing using the flow control system 10 to be used in conjunction with a conventional mass flow control valve 22. A batch of process gas is delivered from a source of pressurized process gas through the flow line 1 of the flow control system 10 to the semiconductor manufacturing apparatus 2 at a controlled flow rate for a delivery period of time.

Ollivier discloses that the actual flow during the delivery phase is measured and the command to the mass flow control valve is adjusted so that the actual flow is kept equal to the set point value in the following delivery phase(s). This operation may be repeated at each delivery phase or after a desired number of delivery phases. The actual value is compared to the desired set point value. If there is any difference between the two values, the flow control system modifies the command signal sent to the mass flow control valve 22 so that the difference (error signal) is reduced to zero.

Ollivier fails to teach or suggest a pressure sensor and a flow rate sensor disposed between a pressure control valve and a flow rate control valve, where the sensors provide signals used by a controller to set and maintain a constant flow rate through the mass flow controller. In contrast, the present invention has the capacity of removing any consequences of an initial pressure fluctuation Δ on the inlet side pressure P_1 or a subsequent pressure fluctuation Δ on the outlet side pressure P_2.

Applicant has reviewed *Tsourides and Porter et al.* and could find no teaching or suggestion that when combined with *Ollivier* cures the deficiencies of *Ollivier*.

Accordingly, Claims 15 and 19 are allowable over *Ollivier* in view of *Tsourides* or *Porter et al.* Allowance of Claims 15 and 19 is hereby solicited.

Claims 16-18 and 31 depend from Claim 15 and are allowable for at least the same reasons as Claim 15. Claims 22-30 depend from Claim 19 and are allowable for at least the same reasons as Claim 19.

As can be appreciated by the cited references of record, this is a very crowded field with a number of skilled engineers attempting to provide improvements, particularly in the manufacturing of semiconductor products. The advantages of our invention, however, provide significant advancements that are not taught in the cited references of record.

> "Thus when differences that may appear technologically minor nonetheless have a practical impact, particularly in a crowded field, the decision-maker must consider the obviousness of the new structure in this light."
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> *Continental Can Co. USA Inc. v. Monsanto Co.*, 20 U.S.P.Q. 2d. 1746, 1752 (Fed. Cir. 1991).

The Federal Circuit has held that a person of ordinary skill in the art must not only have had some motivation to combine the prior art teachings, but some motivation to combine the prior art teachings in the particular manner claimed. *See, e.g., In re Kotzab*, 217 F.3d 1365, 1371 (Fed. Cir. 2000) ("Particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination *in the manner claimed.*" (emphasis added)); *In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998) ("In other words, the examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination *in the manner claimed.*" (emphasis added).

It is believed the case is now in condition for allowance and early notification of the same is requested.

If the Examiner has any questions or suggestions with regards to claim language, the undersigned attorney would appreciate a telephone conference in order to expedite the prosecution of the present case.

Very truly yours,

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